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ABSTRACT

Self-directed learning at work is becoming a major trend in training and organizational development. Referring to theoretical considerations in the domains of motivation and learning in disciplines beyond adult education, the concepts of interest, strategies, control, and evaluation seem appropriate to describe self-directed learning. Constructs of the concept "strategies" are resource management, sequencing, and acquisition. Constructs of "control" include cognitive, metacognitive, and motivational. Constructs of "evaluation" are diagnosis and attribution. Constructs of "interest" include contextual and procedural. With reference to these concepts and constructs, a conceptual model of self-directed learning, the Two-Shell Model of Motivated Self-Directed Learning, has been developed and validated. Impact of selected perceived work conditions (experienced autonomy, competence, and social integration) on this type of learning has been structurally modeled with a sample of 67 employees in the fish processing industry in Germany who were administered the Motivated Self-Directed Learning Questionnaire for Companies. The hypothesis of a directed relation among experienced workplace conditions, interest in self learning, and learning activities was tested. Findings indicate a relatively strong correlation between experienced workplace conditions and self-learning interest and self-learning interest as an explanation for over 50 percent of variance in learning strategies. (Contains 43 references.) (YLB)

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ED 431 915

Gerald A. Straka

Conditions Promoting Self-Directed Learning at the Workplace

Abstract

Self-directed learning at work is becoming a megatrend in training and organizational development. However, there is a wide range of meanings subsumed under this concept. Referring to theoretical considerations in the domains of motivation, interest, strategies of learning and control, a conceptual model of self-directed learning, called the Two-Shell Model of Motivated Self-Directed Learning was developed and validated. The impact of selected perceived work conditions (experienced autonomy, competence and social integration) on this type of learning was structurally modeled with a sample of 67 employees in the fish processing industry. On the basis of these theoretical considerations and results the instrument „project group" is analyzed and recommended to support motivated self-directed learning.

Key words: self-directed learning; motivation, workplace conditions; learning in the process of work.

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1. Introduction

"Lean production", "re-engineering", and "learning organization" occupy a large area in theory and practice of training and organizational development. These considerations have led to more competence being shifted back to the place where a piece of work is machined or a service provided. At the same time, they imply and indeed demand, though not explicitly, a continuing process of training lasting for the whole of working life. In this context, self-directed learning would seem to be assuming growing importance as a complement to other forms of further and in-service training. This form of learning appears to have started out on a journey around the world as such events indicate: The 13th International Self-Directed Learning Symposium held in Scottsdale, Arizona/USA in 1999, the First Asia Pacific Seminar on Self-Directed Learning in Seoul in 1995, the 4ème Colloque Européen sur l'Autoformation (self-formation) held in Dijon/France in 1998 where self-direction in learning was a major focus, and the First World Conference on Self-Directed Learning which took place in Montreal in 1997 followed by the second in Paris/France in June 2000.

1.1 Self-Directed Learning Variously Denominated

While self-directed learning is currently a focal point of discussion worldwide, it signifies in no way that the term is always understood in the same way (Straka, 1997). Philippe Carré (1994), for example, discovered well over 20 different names for self-directed learning while Roger Hiemstra (1996) analyzed all the conference proceedings then existing for the 10th International Symposium on Self-Directed Learning and found over 200.

What, then is self-directed learning and how can one define it? Those seeking an answer to this question will invariably come upon the work ofKnowles (1975). Knowles, who did much to ensure that this type of self-education was accorded the appropriate attention in the theory and practice of adult education, defines

self-directed learning "in its broadest meaning (...) as a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975, 18).

However, if we disregard various prescriptive considerations, such as the learning plan and learning contract or reports of successful use of the method (Knowles et al., 1985), no further theoretical derivation or systematic description is given of what initiative means or what activities take place between the time at which a need to learn is ascertained and the time when the results are assessed (Straka & Nenniger, 1995).

1.2 Instrumentation

A first effort to operationalize and measure some aspects of self-directed learning with reference to Knowles was done with the Self-Directed Learning Readiness Scale (SDLRS) by Guglielmino (1977). This instrument is designated to assess the extent to which individuals perceive themselves to possess the skills and the attitudes frequently associated with self-directedness in learning. The concepts of the instrument were designed through a three-round Delphi survey involving 14 experts on self-directed learning. Administered to 307 persons, a factor analyses identified the following eight factors: Openness to learning opportunities (1); self-concept as an effective, independent learner (2), initiative and independence in learning (3), informed acceptance of responsibility for one's own learning (4), love of learning (5), creativity (6), positive orientation to the future (7), and ability to use basic study skills and problem-solving skills (8) (Guglielmino, 1977).

In the meantime, the SDLRS was translated in different languages and used in more than 150 research efforts (Guglielmino & Guglielmino, 1991). However,

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since 1977 no revalidation of the original factors solution has been published by the author herself, while the instrument was revised and transformed from a 41- to a 58-items questionnaire. Reanalyses by others - e.g. Field (1989), Straka & Hinz (1996) – did not reconstruct the factor solution, and additional studies to determine whether the models hold up when using the entire 58-items scale are recommended (West & Bentley, 1990; Mourad & Torrance, 1979).

An alternative measure of self-direction in learning was developed by Oddi (1984) called the Oddi Continuing Learning Inventory (OCLI). Based on "personality characteristics of individuals whose learning behavior is characterized by initiative and persistence in learning over time through a variety of modes" (Oddi, 1984) three essential dimensions were identified: proactive versus reactive drive (1), cognitive openness versus defensiveness (2), and commitment to learning versus apathy or aversion to learning (3). However, these dimensions were not entirely reconstructed with factor analyses by the author herself (Oddi, 1984) or with a cross-cultural comparison (Straka, 1996).

1.3 Self-Directed Learning – to be Re-Conceptualized

Brockett & Hiemstra conclude in their review that with these approaches the body of knowledge has moved well beyond descriptions of frequencies and nature of self-directed learning activities. However, concerns have been raised about both of the key instruments designed to measure self-directedness. To a large extend, "these concerns can be linked to questions about how self-direction is defined and the theoretical underpinnings of the concept" (Brockett & Hiemstra, 1991, p. 81f.). This evaluation shared with others (Candy, 1991) and our results (Straka, 1996; Straka & Hinz, 1996) was the occasion to re-conceptualize self-directed learning as a dynamic interplay between motivation and learning activities.

2 Concepts and Constructs of Self-Directed Learning

Referring to theoretical considerations in the domains of motivation and learning in disciplines beyond adult education, *interest*, *strategies*, *control* and *evaluation* seem to be appropriate to describe self-directed learning on a general level. In a further step they will be defined with constructs which – we assume – characterize motivated self-directed learning. They will be made more concrete with selected items of the Motivated Self-Directed Learning Questionnaire for Schools and Companies (MSDLQ-S-C). Finally the concepts will be combined and the result will be the validated Two-Shell-Model of Motivated Self-Directed Learning (Straka et al., 1996[1]).

2.1 Learning Strategies

Let us first turn to the construct *acquisition* within the concept of "strategies". With it, on the one side, those activities through which information is condensed and organized (= structuring) are meant. On the other side, identifying differences and similarities, critical analysis and evaluation of information (Brookfield, 1989), transforming into different modes of representation and use (= elaboration) as well as meaningful repetition with the aim of memorizing what has been learned (= rehearsal) are also subsumed under this construct (Danserau, 1978; Pintrich et al., 1991).

[1] Research grants STR266/6-1 und NE 296/11-1 of the German Research Council within the program „Teaching-Learning Processes in Primary Business Education".

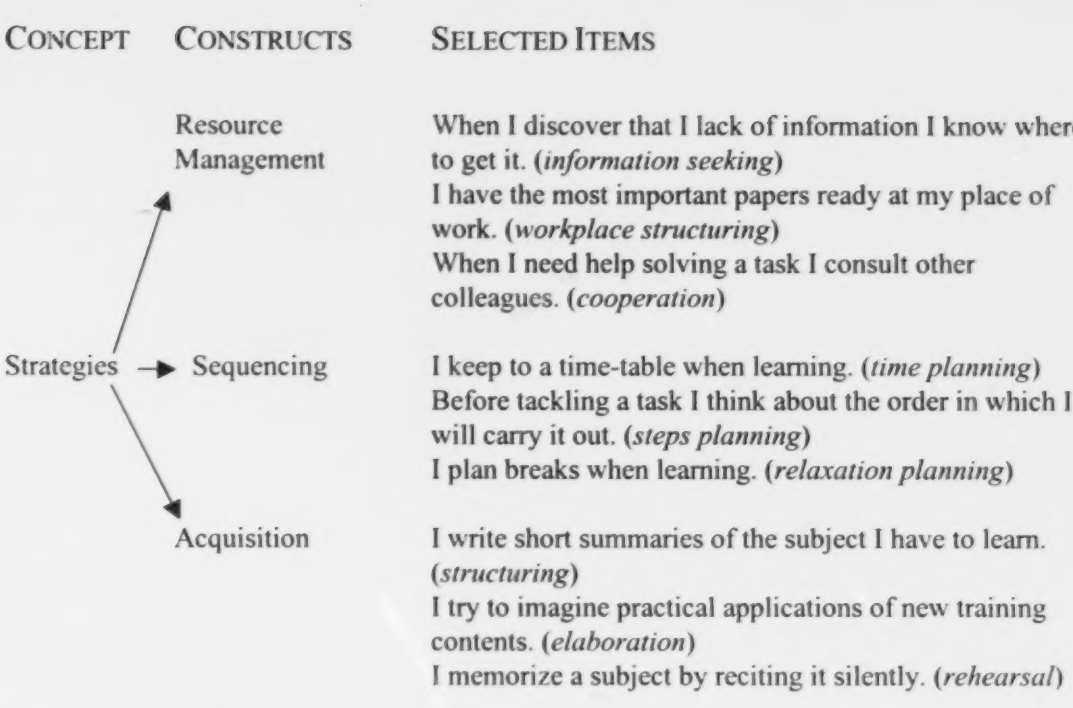
CONCEPT
CONSTRUCTS
SELECTED ITEMS
Resource Management
When I discover that I lack of information I know where to get it. (*information seeking*)
I have the most important papers ready at my place of work. (*workplace structuring*)
When I need help solving a task I consult other colleagues. (*cooperation*)
Strategies
Sequencing
I keep to a time-table when learning. (*time planning*)
Before tackling a task I think about the order in which I will carry it out. (*steps planning*)
I plan breaks when learning. (*relaxation planning*)
Acquisition
I write short summaries of the subject I have to learn. (*structuring*)
I try to imagine practical applications of new training contents. (*elaboration*)
I memorize a subject by reciting it silently. (*rehearsal*)

Figure 1: Constructs of the concept "strategies"

With self-directed learning, those activities, which may occur before acquisition, are given a higher status. They are associated to the constructs sequencing and resource management. Where *resource management* is concerned, activities may be differentiated into those which serve the seeking of information, the structuring of the place of work, or rather of learning, and the co-operation with colleagues as the social dimension of learning in the process of work (Weinstein et al., 1986). Planning one's time, learning steps, and phases of relaxation are assigned to *sequencing* (Pintrich et al., 1991) (cf. Fig. 1).

2.2 Strategies of Control

Acquisition, resource management and sequencing are subject to a control by the respective active person. The concept "control" is differentiated according to cognitive, meta-cognitive, and motivational aspects. The *cognitive* aspect is focussing on concentration, the *meta-cognitive* is differentiated into monitoring, reflection, and regulation (cf. e.g. Brown, 1978, 1984). *Motivational* control is

defined by referring to the value-expectancy model. The value expresses the individual significance a person attributes to a goal he/she has set. The expectancy includes the specific goal orientation towards achieving (appetitive) or avoiding (aversive) it (McClelland, 1955; Berlyne, 1966; Rheinberg, 1997).

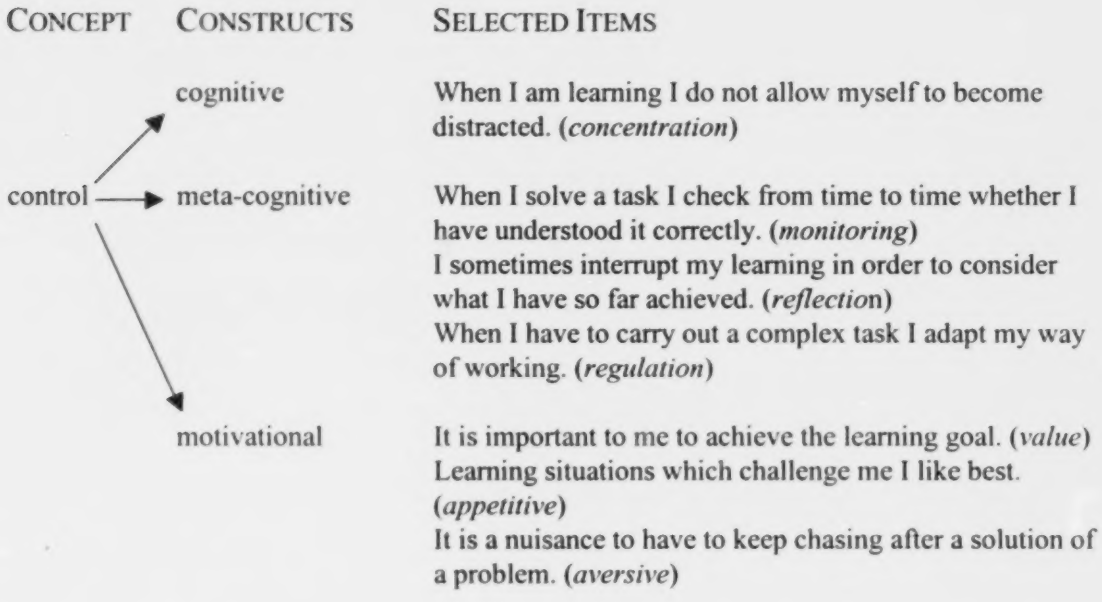
CONCEPT
CONSTRUCTS
SELECTED ITEMS
control
cognitive
meta-cognitive
motivational
When I am learning I do not allow myself to become distracted. (*concentration*)
When I solve a task I check from time to time whether I have understood it correctly. (*monitoring*)
I sometimes interrupt my learning in order to consider what I have so far achieved. (*reflection*)
When I have to carry out a complex task I adapt my way of working. (*regulation*)
It is important to me to achieve the learning goal. (*value*)
Learning situations which challenge me I like best. (*appetitive*)
It is a nuisance to have to keep chasing after a solution of a problem. (*aversive*)

Figure 2: Constructs of the concept "control"

2.3 Evaluation

The summative evaluation of the learning attempt is subsumed under the concept of "evaluation". It consists of the constructs diagnosis and attribution.*Diagnosis* refers to the summative and subjective assessment of the learning result as the difference between the anticipated goal and the actually achieved learning result. *Attribution* involves establishing the reasons why a specific learning result was realized. According to attribution-theoretical considerations (Weiner, 1986), three dimensions are differentiated: the dimension controllability focuses the question whether acting and learning occurred inevitably or not. The dimension person dependency comprises the assessment whether a learning result was achieved through personal involvement or others. The dimension stability

concerns the question whether the conditions under which a learning result was achieved remained constant or not.

CONCEPT	CONSTRUCTS	SELECTED ITEMS
	Diagnosis	I have learned in the way I intended. (*diagnosis*)
Evaluation	Attribution	Whether I attained the working aim nor not was a matter of chance. (*controllability*) My way of doing things was influenced by others. (*dependency*) Even if I had to deal with this task again I would do it in exactly the same way. (*stability*)

Figure 3: Constructs of the concept "evaluation"

2.4 Interest

The realization of the above mentioned activities presupposes that the learner has already prepared her/himself for learning, that s/he is so to speak "ready to go". Knowles (1975) defines this as initiative. In line with didactical thinking in Germany, at least since Herbart (1806) this aspect has been introduced with the concept "interest". Referring back to later, empirical and theoretical studies in this and related fields (Deci & Flaste, 1995; Krapp, 1999; Pintrich, P. R. & Schunk C. H., 1996; Prenzel, 1988; Prenzel et al., 1998), the difference is made between interest in the content and in the procedures (Nenniger et al., 1996). Both types of interest are defined on the basis of the value-expectancy model (Atkinson, 1964).

In the case of *contentual interest* the value component relates to the significance attributed to the subject-matter being learned, hence the content aspect of the learning objective. The expectancy component relates to the individual's assessment of her/his ability to grasp the content of what s/he is desiring to learn. In the case of *procedural interest* the value component expresses the importance

attributed by the learner to certain modes of behavior or strategies in order to achieve the learning objective. Here, the expectancy component relates to the individual's assessment of her/his ability to implement such learning activities. The considerations from the procedural point of view are focussed on the activities that have been grouped under the concepts of strategies, control and evaluation concepts.

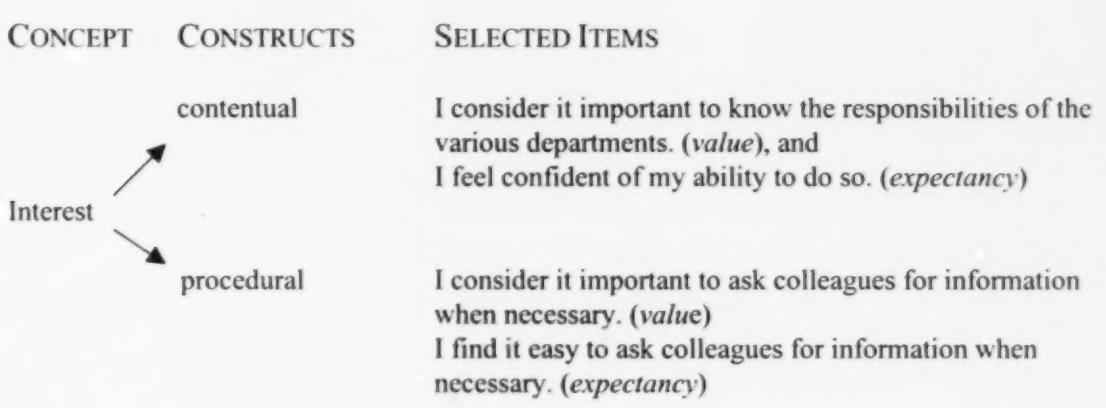
CONCEPT
CONSTRUCTS
SELECTED ITEMS
contentual
I consider it important to know the responsibilities of the various departments. (*value*), and
I feel confident of my ability to do so. (*expectancy*)
Interest
procedural
I consider it important to ask colleagues for information when necessary. (*value*)
I find it easy to ask colleagues for information when necessary. (*expectancy*)

Figure 4: Constructs of the concept "interest"

2.5 The Two-Shell-Model of Motivated Self-Directed Learning

Learning may be defined in general as an interaction of an individual with her/his environmental conditions on the basis of her/his developed internal conditions with durable change of them (Hilgard & Bower, 1966;Gagné, 1977). In the case of learning in the process of work the environmental conditions are the tasks associated with the job, the equipment, the organization of the company, etc. Internal conditions comprise knowledge, skills, values, etc. as conditions and results of the individual's interactions. These are the individual's learning orientations and activities, some of them have just been introduced and subsumed under the concepts of interest, strategies of learning, control, and patterns of evaluation. Structuring these concepts we obtain what we call the Two-Shell Model of Motivated Self-Directed Learning:

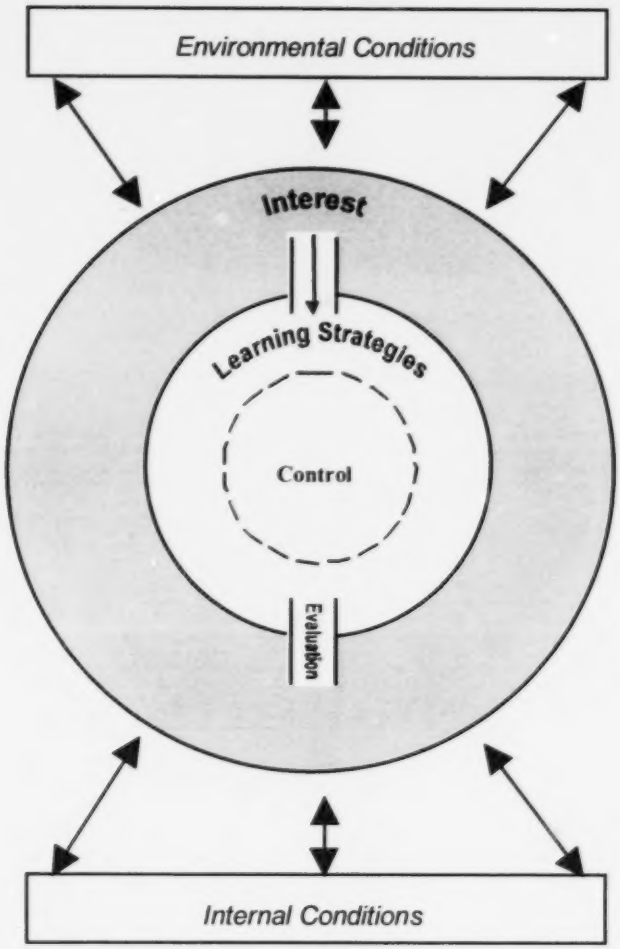

Figure 5: The Two-Shell-Model of Motivated Self-Directed Learning

On the basis of this validated model (Straka et al., 1996) self-directed learning may be defined as a process in which a person approaches a learning subject, i.e. a perceived part of her/his environmental conditions, with an interest under contentual and procedural perspectives, applies strategies of resource management, sequencing and acquisition, controls their application cognitively, meta-cognitively and motivationally as well as evaluates the achieved learning result by diagnosing and attributing it.

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3 Perceived Work Conditions

In the field of training and development in business and industry a core question is: Which environmental conditions contribute that self-directed learning in the process of work is supported? Since the Hawthorne studies (Homans, 1965) and from a constructivist view as well an answer is: The individually "perceived" rather than the "objective" work conditions may contribute to the practice of this type of learning. Referring to the theoretical and empirically validated considerations of Deci and Ryan, environmental conditions may be experienced by the individual from the perspectives of autonomy, competence and social integration (Deci & Ryan, 1985). These perspectives were translated for work-place conditions as follows:

- *Experiencing autonomy* at the place of work is when a person has the impression s/he has scope, that is to say that s/he is able to carry out her/his work tasks according to her/his own schedules.

- *experiencing competence* at the place of work is when a person has the impression s/he carries out her/his work tasks competently as well as successfully and when s/he feels her/himself to be effective.

- *experiencing social integration* at the place of work is felt by a person when her/his tasks are acknowledged by superiors and colleagues and s/he feels integrated in the works community.

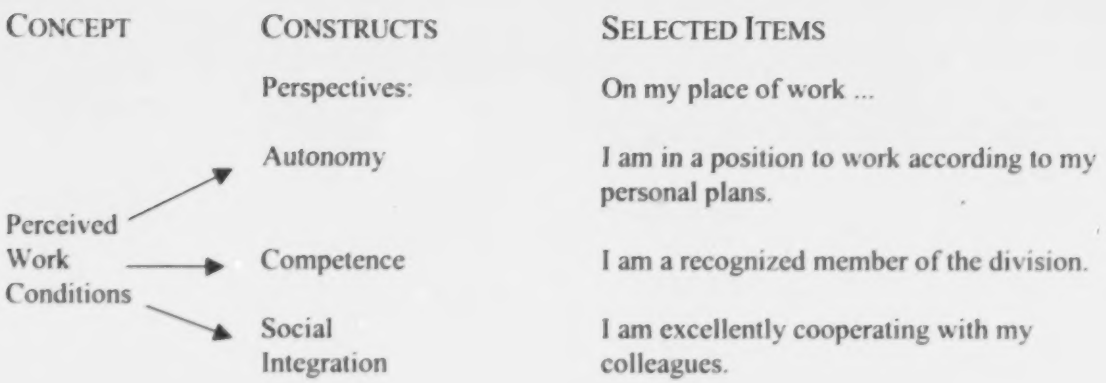

Figure 6: Constructs of the concept "perceived workplace conditions"

4 Hypotheses, Instrumentation, Sample, and Results

4.1 Hypotheses

Self-directed learning as a dynamic interplay between interest, learning, control, and evaluation will be related in this context to selected experienced workplace conditions. They may have a direct relation to interests which themselves may have an impact on learning activities. On the basis of these considerations the hypothesis is: Experienced workplace conditions may have an impact on self-learning interest which itself may have a directed relation to learning activities.

The assumed linear relations are tested with the program LISREL8 (Jöreskog & Sörbom, 1993), that follows the structural equation modeling approach (SEM). SEM allows the estimation of linear structural relations between observed and latent variables, the latter indicated by observed variables. According to the notion of this model "experienced workplace conditions", "self-learning interest" and "learning activities" have the function of latent variables. Experienced workplace conditions are indicated by the observed variables experienced autonomy, competence, and social integration. As the focus is on learning activities, the self-learning interest is indicated by the construct procedural interest with its measured value and expectancy components. The latent variable

"learning activities" is indicated by the constructs metacognitive and motivational control, acquisition, resource management and sequencing.

4.2 Instrumentation and Sampling

These nine constructs are measured with the Motivated Self-Directed Learning Questionnaire for Companies (MSDLQ-C). It is a modularized self-rating instrument validated in different settings. Each of the constructs consists of one ore more sub scales, composed of – all together - 106 items. The 106 items are rated according to four levels (absolutely, large, and limited extend, not at all). Principal component factor analyses revealed that all items are loading > 0.4 on the constructs and each module has an explained variance > 0.5 (for exact results see Nenniger et al., 1996a, 1998)[2]. On the basis of these factor analyses Z-transformed factor-scores are calculated for each sub scale, which are condensed to compressed factor-scores of each construct. A correlation matrix of these variables is the input-matrix for LISREL8.

The sample included 67 of 72 employees working in the fish processing industry near the city of Bremen. 46 % had an average secondary school education and 54 % a grammar-school education and above; 58 % were female and 73 % under 40 years of age.

4.3 Results

The hypothesis of a directed relation between "experienced workplace conditions", "interest in self-learning" and "learning activities" was examined with LISREL8. The results are to be found in figure 7:

[2] As Cronbach's alpha assumes the same weight for each item whereas the model of factor analyses tries to identify the weight of each item on the factor, which is mostly different in reality, Cronbach's alpha is not appropriate.

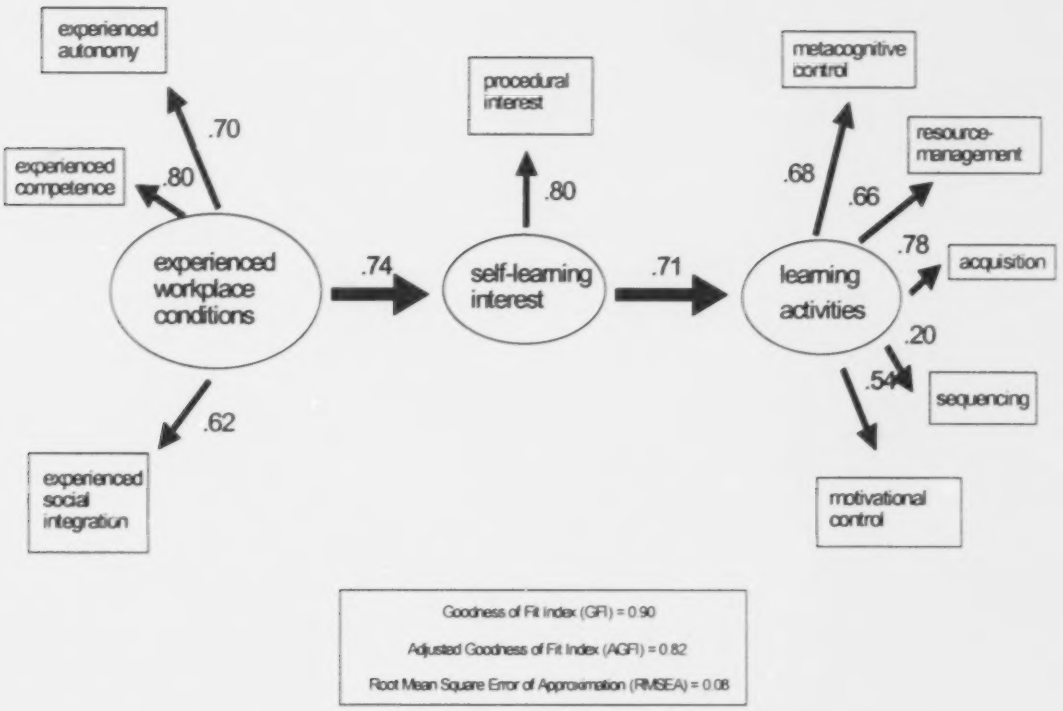

Figure 7: Experienced workplace conditions, interest in self-learning and learning activities

The fit of the model is indicated by several fit-indices LISREL8 is offering. The GFI (Goodness of Fit) and the AGFI (Adjusted Goodness of Fit) are measures for the variance explained by the model. Both can range from 0 to 1, a value close to 1 indicates a good model fit. The RMSEA (Root Mean Square Error of Approximation) shows the difference between the real correlation matrix and the correlation matrix estimated by the model. A RMSEA close to 0 indicates a good fit. The estimated values (figure 7) give evidence for an appropriate fit of the model tested.

A relatively strong correlation between "experienced work-place conditions" and "self-learning interest" (.74) could be established. The squared multiple correlation R^2 (54.7) is a measure for the strength of the assumed linear

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relationship. It can be interpreted as the explained share of variance i.e. the experiences work-place conditions explain 54.7 % of variance of the latent variable "self-learning interest". The relation between "interest in self-learning" and "learning activities" (.71; R^2 = 50.4 %) indicates that self-learning interest again explains 50.4 % of variance of learning strategies.

The assumption that self-directed learning is interconnected with motivation and distinct learning activities could be reconstructed with this sample. This result may be interpreted as another proof for the Two-Shell-Model of Motivated Self-Directed Learning and the theory of self-determination applied in the context of work and self-directed learning. Experience of autonomy, competence and social integration summarized with "experienced work conditions" have a distinct impact on interest for this type of learning which itself is strongly related to "learning activities" as hypothesized.

5 Conclusions

In the meantime the structural hypothesis in paragraph 4 was reconfirmed with a sample of older employees (Straka et al., 1999). This result is again an indicator for the robustness of this structural relation assumed with the Two-Shell Model of Motivated Self-Directed Learning. For further steps, additional constructs concerning formal and informal aspects of companies' cultures and selected internal conditions of the employees (e.g. knowledge, skills) should be considered.

On the basis of such results the question about establishing conditions which bring forth these experienced qualities may be raised. An answer is the use of the instrument "project group", a common instrument in the planning, executing and steering of company processes of change. Especially in the realization of

changes that affect more than one department does this instrument make sense, not least since problems often have affected the necessary co-operation between different areas and departments which are detrimental to the experiencing of autonomy, competence and social integration (Nieder, 1997). In order to oppose such developments certain rules are to be borne in mind to let experiences come up supporting self-determination:

- A project group ought not to consist of more than nine members so that everyone may make contributions (promoting competence).

- Basically, every member of a project group is considered as an expert in her/his field; therefore all members of the group should have the opportunity to contribute (promoting competence).

- The basis for personnel leadership is trust (Nieder, 1997). Within the project group, the freedom to make decisions is given to the members of the project group (promoting autonomy).

- The project group ought to have a spokesperson who prepares the meeting (for example an agenda), who co-ordinates the spoken contributions and who pays attention to the social climate of the group (promoting social integration).

- The work in the project group is seen as in-company further training. Every project group member is therefore a multiplier for his colleagues (promoting competence).

- When selecting the project task it is to be borne in mind that dealing with the project task demands communication and co-operation with other colleagues and is a suitable means of strengthening the "us-feeling" in the department or branch (promoting social integration).

This result of the analysis of the features of a project group from a perspective of conditions promoting self-determination as a key of self-directed learning and acting, indicates why the project group is a successful tool in the context of organizational development. Therefore, further instruments should be analyzed from the perspective of these theoretically and empirically validated considerations.

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